Methodology and assumptions on the macroeconomic impact analysis of package 1
as of 3 July 2017

The Global Integrated Monetary and Fiscal (GIMF) model of the International Monetary Fund was used to conduct the macroeconomic simulation for the proposed tax reform. GIMF is a dynamic stochastic general equilibrium (DSGE) model. The model is dynamic as it optimizes consumer and firm behaviors across a finite planning horizon, and stochastic as it accounts for intertemporal effects of random shocks.

GIMF model runs on MATLAB and Dynare programs. Operating GIMF mainly involves two steps: (1) calibrating a steady-state for the Philippines, and (2) coding the shocks that will occur through time. Steady state values were derived by averaging the values of the different variables from 2012 to 2016. The following values were used to calibrate the Philippine steady state:

Table 1: Assumed steady state values in percent of GDP

Variable	**Steady state value**
Government consumption	13.2
Government investment	2.6
Tax revenue from consumption taxes	5.8
Tax revenue from capital taxes	4.2
Tax revenue from labor taxes	2.0
Tax revenue from lump-sum taxes and non-tax revenues	3.2
Government debt	42.6
Total investment	20.0

Three sets of shocks were designed to simulate three scenarios. These are the 'DOFamended', 'HB5636', and the base case.

a. The 'DOFamended' case represents the shocks that will occur if the amended tax reform package 1 as proposed by the Department of Finance is passed and implemented;

b. The 'HB5636' case represents the shocks that will occur if House Bill 5636 is passed and implemented; and

c. The base case represents the shocks that will occur if no change in tax policy occurs.

The 'DOFamended' case accounts for revenue eroding measures (lower labor taxes) and revenue gaining measures (higher consumption taxes from broader value-added tax (VAT) base, oil excise indexed to inflation, and higher automobile excise). The potential revenues from the excise on sugar-sweetened beverages, motor vehicle user charge, estate and donors' tax, and estate tax amnesty were also factored in. Revenues from better tax administration will increase as reducing VAT exemptions make tax policy simpler and thus easier to implement. Public investment efficiency increases to a peak of 80 percent which means this much of the investment spending translates to additional public capital stock. 40

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percent of incremental oil excise revenues will go to targeted transfers implemented through the unconditional cash transfer (UCT) program for one year.

Table 2: Assumed shocks for the 'DOFamended' case in percentage point of GDP[1]

DOF amended	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Lower PIT	-0.78	-0.78	-0.78	-0.97	-0.97	-0.97	-0.97	-0.97	-0.97	-0.97
VAT	0.51	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67
Oil excise	0.42	0.65	0.72	0.69	0.66	0.66	0.66	0.66	0.66	0.66
Auto excise	0.14	0.14	0.14	0.13	0.13	0.13	0.13	0.13	0.13	0.13
MV user charge	0.07	0.07	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
Sugar excise	0.27	0.26	0.25	0.23	0.22	0.22	0.22	0.22	0.22	0.22
Estate and donors' tax	-0.02	-0.02	-0.02	-0.02	-0.01	-0.01	-0.01	-0.01	-0.01	-0.01
Estate tax amnesty	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tax administration	0.25	0.30	0.33	0.36	0.39	0.59	0.79	0.99	1.19	1.35
Tax revenues	0.9	1.3	1.4	1.2	1.2	1.4	1.6	1.8	2.0	2.1
Public investment	2.2	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Infrastructure	2.1	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Efficient	1.3	1.6	1.5	1.6	1.7	1.7	1.7	1.7	1.7	1.7
Inefficient	0.7	0.7	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4
Transfers	0.2									
Deficit	1.32	1.02	0.75	0.94	0.96	0.76	0.56	0.36	0.16	0.00

The '*HB5636*' case accounts for revenue eroding measures (even lower labor taxes than the DOF amended bill) and revenue gaining measures (VAT base expansion, oil excise hike which wasn't indexed to inflation, and staggered automobile excise hike). The potential revenues from the excise on sugar-sweetened beverages, motor vehicle user charge, estate and donors' tax, and estate tax amnesty were also factored in. Revenues from better tax administration will increase as reducing VAT exemptions make tax policy simpler and thus easier to implement. Public investment efficiency also increases to a peak of 80 percent which means this much of the investment spending translates to additional public capital stock. 40 percent of incremental oil excise revenues will go to targeted transfers implemented through the unconditional cash transfer (UCT) program for four years.

Table 3: Assumed shocks for the HB5636 case in percent of GDP[2]

HB5636	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Lower PIT	-0.8	-0.8	-0.8	-1.0	-1.0	-1.0	-0.98	-0.98	-0.98	-0.98
VAT	0.5	0.6	0.6	0.6	0.6	0.6	0.64	0.64	0.64	0.64
Oil excise	0.4	0.6	0.7	0.7	0.6	0.6	0.61	0.61	0.61	0.61
Auto excise	0.1	0.1	0.1	0.1	0.1	0.1	0.11	0.11	0.11	0.11
MV user charge	0.1	0.1	0.1	0.1	0.1	0.1	0.08	0.08	0.08	0.08
Sugar excise	0.3	0.3	0.2	0.2	0.2	0.2	0.22	0.22	0.22	0.22
Estate and donors' tax	0.0	0.0	0.0	0.0	0.0	0.0	-0.01	-0.01	-0.01	-0.01
Estate tax amnesty	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00	0.00
Tax administration	0.3	0.3	0.3	0.4	0.4	0.6	0.8	1.0	1.2	1.4
Tax revenues	0.8	1.2	1.3	1.1	1.1	1.3	1.5	1.7	1.9	2.1
Public investment	2.2	2.3	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Infrastructure	2.1	2.1	1.8	1.9	2.1	2.1	2.1	2.1	2.1	2.1
Efficient	1.3	1.4	1.3	1.4	1.7	1.7	1.7	1.7	1.7	1.6
Inefficient	0.9	0.9	0.8	0.7	0.4	0.4	0.4	0.4	0.4	0.4
Transfers	0.2	0.3	0.3	0.3						
Deficit	1.5	1.1	0.8	1.0	1.1	0.9	0.7	0.5	0.3	0.0

[1] Figures may not add up due to rounding

[2] Figures may not add up due to rounding

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Lastly, the base case only accounts for gains from better tax administration. These gains will be lower than those from the 'DOFamended' case as VAT exemptions which complicate the system are still not removed. Spending was assumed to be half the spending of the tax reform.

Table 4: Assumed shocks for the base case in percent of GDP[3]

Base case	2017	2018	2019	2020	2021
Lower PIT					
VAT					
Oil excise					
Auto excise					
MV user charge					
Sugar excise					
Tax administration	0.1	0.1	0.1	0.1	0.1
Tax revenues	0.08	0.10	0.11	0.12	0.13
Public investment	1.1	1.2	1.1	1.1	1.1
Infrastructure	1.1	1.2	1.1	1.1	1.1
Efficient	0.7	0.7	0.6	0.6	0.6
Inefficient	0.4	0.5	0.4	0.4	0.4
Transfers					
Deficit	1.0	1.1	1.0	0.9	0.9

[3] Figures may not add up due to rounding

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